

We claim:

1           1. A method for processing multimedia data in a User Datagram Protocol (UDP)  
2       layer of a wireless receiver conforming to an Internet Protocol (IP) standard, said method  
3       comprising the steps of:

4               receiving error information with said multimedia data from a Radio Link Protocol  
5       (RLP) layer; and

6               forwarding said error information with said multimedia data to a higher layer.

1           2. The method of claim 1, wherein said error information comprises a set of  
2       logical transmission unit (LTU) error indicators associated with each packet.

1           3. The method of claim 2, wherein said error indicators point to a starting and  
2       ending location of erroneous data.

1           4. The method of claim 1, further comprising the step of performing a packet  
2       header cyclic redundancy check (CRC).

1           5. The method of claim 4, further comprising the step of forwarding said error  
2       indicator, logical transmission unit (LTU) size and a packet payload to the FEC decoder if said  
3       packet header is valid.

1           6. The method of claim 4, further comprising the step of forwarding said error  
2       indicator and a packet payload to the FEC decoder if said packet header is valid.

1           7. The method of claim 1, further comprising the step of processing said error  
2       information to identify an erasure within each packet.

1                   8. The method of claim 1, wherein said multimedia data has been encoded using  
2 Maximal Distance Separable (MDS) codes.

1                   9. The method of claim 8, wherein said Maximal Distance Separable (MDS)  
2 codes are Reed-Solomon codes.

1                   10. The method of claim 8, wherein said Maximal Distance Separable (MDS)  
2 codes are applied to a number, k, of information packets comprised of X data units, and wherein  
3 up to X codewords are formed of length n using one data unit from each of said k information  
4 packets.

1                   11. The method of claim 8, wherein said Maximal Distance Separable (MDS)  
2 codes are applied to a number, k, of information packets comprised of X data units, and wherein  
3 up to X/L codewords of length nL are formed using L data units from each of said k information  
4 packets.

1                   12. The method of claim 8, wherein a first set of said Maximal Distance Separable  
2 (MDS) codes are applied to each of said information packets comprised of X data units to create  
3 k information packets comprised of X' data units, and a second set of said MDS codes are applied  
4 to of said information packets comprised of X' data units, and wherein up to X' codewords are  
5 formed using one data unit from each of said k information packets.

1                   13. The method of claim 1, wherein said error information includes a reformatted  
2 packet including frame error information from a lower layer.

1                   14. The method of claim 13, further comprising the step of forwarding said  
2 reformatted packet to the FEC decoder if a cyclic redundancy check (CRC) on a packet header is  
3 valid.

1           15. The method of claim 1, wherein said UDP layer further specifies additional  
2    packet handling procedures in accordance with a complete User Datagram Protocol (CUDP).

1           16. A method for receiving multimedia data in a wireless packet network  
2    comprising the steps of:

3           processing said multimedia data to determine if said multimedia data is properly  
4    received; and

5           forwarding error information with said multimedia data to a higher layer.

1           17. The method of claim 16, wherein said error information comprises a set of  
2    logical transmission unit (LTU) error indicators associated with each packet.

1           18. The method of claim 17, wherein said error indicators point to a starting and  
2    ending location of erroneous data.

1           19. The method of claim 16, further comprising the step of performing a packet  
2    header cyclic redundancy check (CRC).

1           20. The method of claim 16, wherein said multimedia data has been encoded  
2    using Maximal Distance Separable (MDS) codes.

1           21. The method of claim 16, wherein said error information includes a reformatted  
2    packet including frame error information from a lower layer.

1           22. The method of claim 21, further comprising the step of forwarding said  
2    reformatted packet to an FEC decoder if a cyclic redundancy check (CRC) on a packet header is  
3    valid.

1           23. The method of claim 16, wherein said UDP layer further specifies additional  
2    packet handling procedures in accordance with a complete User Datagram Protocol (CUDP).

1           24. A system for processing multimedia data in a User Datagram Protocol (UDP)  
2    layer of a wireless receiver conforming to an Internet Protocol (IP) standard, said system  
3    comprising:

4            a memory for storing computer readable code; and  
5            a processor operatively coupled to said memory, said processor configured to:  
6            receive error information with said multimedia data from a Radio Link Protocol  
7    (RLP) layer; and  
8            forward said error information with said multimedia data to a higher layer.

1           25. The system of claim 24, wherein said error information comprises a set of  
2    logical transmission unit (LTU) error indicators associated with each packet.

1           26. The system of claim 25, wherein said error indicators point to a starting and  
2    ending location of erroneous data.

1           27. The system of claim 24, wherein said processor is further configured to  
2    perform a packet header cyclic redundancy check (CRC).

1           28. The system of claim 27, wherein said processor is further configured to  
2    forward said error indicator, logical transmission unit (LTU) size and a packet payload to the  
3    FEC decoder if said packet header is valid.

1           29. The system of claim 27, wherein said processor is further configured to  
2    forward said error indicator and a packet payload to the FEC decoder if said packet header is  
3    valid.

1                   30. The system of claim 24, wherein said processor is further configured to  
2 process said error information to identify an erasure within each packet.

1                   31. The system of claim 24, wherein said multimedia data has been encoded using  
2 Maximal Distance Separable (MDS) codes.

1                   32. The system of claim 31, wherein said Maximal Distance Separable (MDS)  
2 codes are Reed-Solomon codes.

1                   33. The system of claim 31, wherein said Maximal Distance Separable (MDS)  
2 codes are applied to a number, k, of information packets comprised of X data units, and wherein  
3 up to X code words are formed of length n using one data unit from each of said k information  
4 packets.

1                   34. The system of claim 31, wherein said Maximal Distance Separable (MDS)  
2 codes are applied to a number, k, of information packets comprised of X data units, and wherein  
3 up to X/L code words of length nL are formed using L data units from each of said k information  
4 packets.

1                   35. The system of claim 31, wherein a first set of said Maximal Distance  
2 Separable (MDS) codes are applied to each of said information packets comprised of X data units  
3 to create k information packets comprised of X' data units, and a second set of said MDS codes  
4 are applied to of said information packets comprised of X' data units, and wherein up to X' code  
5 words are formed using one data unit from each of said k information packets.

1                   36. The system of claim 24, wherein said error information includes a reformatted  
2 packet including frame error information from a lower layer.

1                   37. The system of claim 36, wherein said processor is further configured to  
2 forward said reformatted packet to the FEC decoder if a cyclic redundancy check (CRC) on a  
3 packet header is valid.

1                   38. A system for receiving multimedia data in a wireless packet network  
2 comprising:

3                   a memory for storing computer readable code; and  
4                   a processor operatively coupled to said memory, said processor configured to:  
5                   process said multimedia data to determine if said multimedia data is properly  
6 received; and  
7                   forward error information with said multimedia data to a higher layer.

1                   39. The system of claim 38, wherein said error information comprises a set of  
2 logical transmission unit (LTU) error indicators associated with each packet.

1                   40. The system of claim 39, wherein said error indicators point to a starting and  
2 ending location of erroneous data.

1                   41. The system of claim 38, wherein said processor is further configured to  
2 perform a packet header cyclic redundancy check (CRC).

1                   42. The system of claim 38, wherein said multimedia data has been encoded using  
2 Maximal Distance Separable (MDS) codes.

1                   43. The system of claim 38, wherein said error information includes a reformatted  
2 packet including frame error information from a lower layer.

1                   44. The system of claim 43, wherein said processor is further configured to  
2 forward said reformatted packet to an FEC decoder if a cyclic redundancy check (CRC) on a  
3 packet header is valid.

1           45. A method for transmitting a multimedia packet from a wireless packet  
2 network to a wired network conforming to the Internet Protocol (IP), said multimedia packets  
3 encoded using a forward error correction (FEC) coding technique, said method comprising the  
4 steps of:

5           embedding frame error information in said multimedia packet;  
6           forwarding said multimedia packet to a receiver on said wired network; and  
7           discarding a multimedia packet having an unrecoverable frame error.

1           46. The method of claim 45, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to a number,  $k$ , of  
3 information packets comprised of  $X$  data units, and wherein up to  $X$  codewords are formed of  
4 length  $n$  using one data unit from each of said  $k$  information packets.

1           47. The method of claim 45, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to a number,  $k$ , of  
3 information packets comprised of  $X$  data units, and wherein up to  $X/L$  codewords of length  $nL$   
4 are formed using  $L$  data units from each of said  $k$  information packets.

1           48. The method of claim 45, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to each of said  
3 information packets comprised of  $X$  data units to create  $k$  information packets comprised of  $X'$   
4 data units, and a second set of said MDS codes are applied to of said information packets  
5 comprised of  $X'$  data units, and wherein up to  $X'$  codewords are formed using one data unit from  
6 each of said  $k$  information packets.

1           49. A method for transmitting a multimedia packet from a wireless packet  
2 network to a wired network conforming to the Internet Protocol (IP), said multimedia packets

3 encoded using a forward error correction (FEC) coding technique, said method comprising the  
4 steps of:

5 decoding said multimedia packet using frame error information;  
6 forwarding said multimedia packet to a receiver on said wired network; and  
7 discarding a multimedia packet having an unrecoverable frame error.

1 50. The method of claim 49, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to a number, k, of  
3 information packets comprised of X data units, and wherein up to X codewords are formed of  
4 length n using one data unit from each of said k information packets.

1 51. The method of claim 49, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to a number, k, of  
3 information packets comprised of X data units, and wherein up to X/L codewords of length nL  
4 are formed using L data units from each of said k information packets.

1 52. The method of claim 49, wherein said forward error correction (FEC) coding  
2 technique employs Maximal Distance Separable (MDS) codes that are applied to each of said  
3 information packets comprised of X data units to create k information packets comprised of X'  
4 data units, and a second set of said MDS codes are applied to of said information packets  
5 comprised of X' data units, and wherein up to X' codewords are formed using one data unit from  
6 each of said k information packets.

1 53. A system for transmitting a multimedia packet from a wireless packet network  
2 to a wired network conforming to the Internet Protocol (IP), said multimedia packets encoded  
3 using a forward error correction (FEC) coding technique, comprising:

4 a memory for storing computer readable code; and  
5 a processor operatively coupled to said memory, said processor configured to:  
6 embed frame error information in said multimedia packet;  
7 forward said multimedia packet to a receiver on said wired network; and

8 discard a multimedia packet having an unrecoverable frame error.

1                   54. A system for transmitting a multimedia packet from a wireless packet network  
2                   to a wired network conforming to the Internet Protocol (IP), said multimedia packets encoded  
3                   using a forward error correction (FEC) coding technique, comprising:

4 a memory for storing computer readable code; and  
5 a processor operatively coupled to said memory, said processor configured to:  
6 decode said multimedia packet using frame error information;  
7 forward said multimedia packet to a receiver on said wired network; and  
8 discard a multimedia packet having an unrecoverable frame error.